

West Village Renewable-Based Energy Secure Community

August 2011

Fact Sheet

The Issue

West Village is a mixed-use community on the University of California, Davis campus that will provide 3,000 residents with affordable, reliable, and secure energy. It will be a model for future communities and help accelerate the adoption and use of scalable renewable energy systems in California.

West Village (WV) aims to be a Zero Net Energy (ZNE) community through the integration of a diverse array of distributed energy resources (DER) using commercially available and state-of-the-art technologies. The integration of DER technologies in large scale development poses a set of challenges. The technical complexity challenges facing intelligent energy asset optimization at a community level is very costly for any single market stakeholder to take on. Further, the envisioned energy infrastructure required at WV requires a significant upfront investment in the horizontal and vertical build out of the community.

The goal of this project is to make WV an integrated, self sufficient community. There are several technical challenges this PIER funded project will address:

- How to integrate and optimize multiple DERs with a SmartGrid at a community scale. This involves the connection of each DER technology into the Smart Grid, the interconnection to a static disconnect switch, and the integration of Plug-in Hybrid Electric Vehicle fueling stations .
- How to optimize each specific DER technology, especially the biogas digester, so that they run as efficiency and cleanly as possible and produce the maximum benefit to WV.



Artistic rendition of West Village.

Courtesy UC Davis

- How to integrate performance monitoring into the SmartGrid system. This includes performance metrics, metering sensors and software, and the user interface.
- How to build additional functionality into the SmartGrid so that it contains advanced tools for consumers, is able to adopt to new technologies and changes in the future.

Project Description

WV will achieve the ZNE goal by integrating solutions that reduce energy consumption with an array of indigenous DER in an economic and technically optimal manner. Planned DER technologies include energy efficiency, demand response, solar photovoltaic, solar thermal, fuel cells, advanced energy storage, SmartGrid technology, biogas digester, biomethane upgrade system, and biofuels for transportation.

PIER Program Objectives and Anticipated Benefits for California

WV was designed to meet these objectives and benefits:

- ZNE consumption for the community over the course of each year
- Energy costs per household that are less than or on par with what would have been achieved under a "business as usual" model
- Housing that is more affordable than the local Davis market
- Reduced GHG emissions for the community as a whole (including transportation)
- Ability to operate independently from the grid during an extended outage
- Reliable and secure energy for the community, based on 100% on-site generation from DRE and interconnection to the local grid. This will make the WV less vulnerable to interruptions and emergencies from imported energy
- Affordable and stable energy costs based on a carefully considered business model and the optimal mix of low-cost renewable resources
- An environmentally conscious and clean community from a holistic design that includes reduced energy consumption, clean energy, reduced transportation emissions and congestion, water reduction, and waste and water reuse
- A model for future communities, so that others can learn from the innovative design and associated processes used at the WV
- Enhanced quality of life for community residents due to, stable and affordable energy, and an environment that encourages healthy living

Project Specifics

Grant Agreement Number: PIR-08-035

Recipient: University of California, Davis

City/County: Davis, Yolo County

Amount: \$1,994,322

Cofunding: \$2,029,148 from University of California, Davis

Term: July 29, 2009 – March 31, 2014

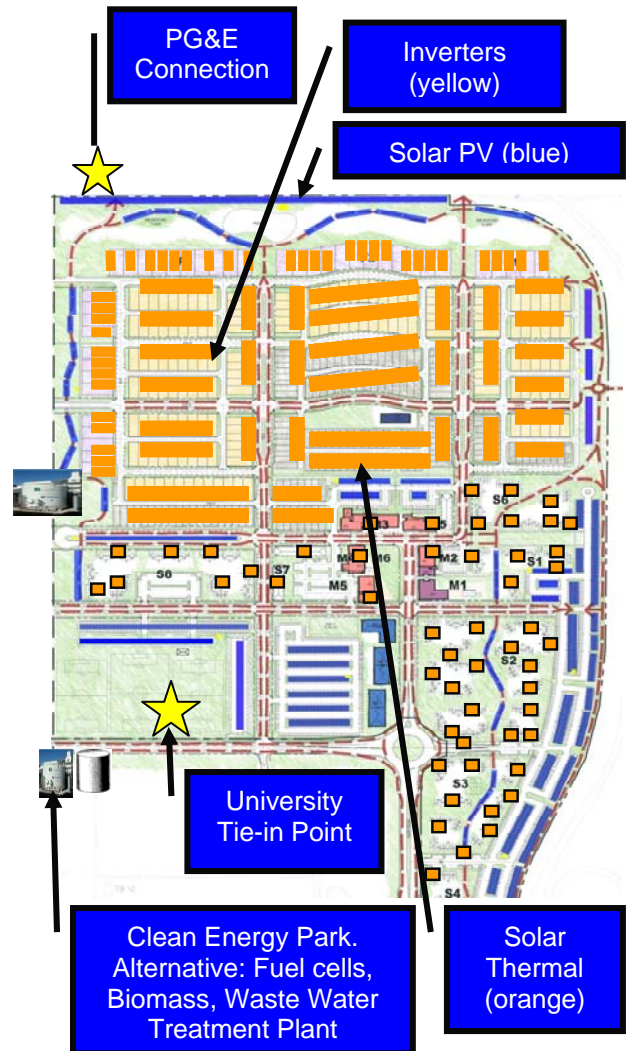
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West Village Schematic
Courtesy UC Davis

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